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EXAMINER	
MOFFAT, JONATHAN	

ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 08/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/501,010	HANSEN, PER WAABEN	
	Examiner	Art Unit	
	Jonathan Moffat	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-76* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-6,15,16,18,19,22,24,26,30,32,36,38,40,44-53,55,60-62,65 and 72-76* is/are rejected.

7)☒ Claim(s) *3,7-14,17,20,21,23,25,27-29,31,33-35,37,39,41-43,54,56-59,63,64 and 66-71* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/26/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's amendments to the drawings and claims, filed 6/26/2006, are accepted and appreciated by the examiner. In response, all previous objections to the claims and drawings are hereby withdrawn.

Claim Objections

Claim 61 is objected to for being of improper dependent form. Claim 61 is directed to "the set of stable objects" of the method of claim 1. Claim 1 is a method for calibrating X-ray inspection devices which uses said set of stable objects as a calibration standard. However, the method of claim 1 neither produces nor alters the set of stable objects. Further, one cannot infer any extra patentable weight from claim 1 into claim 61 as a set of stable objects used in another similar method could also be used in the method of claim 1.

From the MPEP 608.01(n)III:

> III. **INFRINGEMENT TEST**
>
> The test as to whether a claim is a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112, fourth paragraph) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim.

As has been shown by use of the prior art, Kowalski alone discloses a set of stable objects suitable for X-ray calibration. However, Kowalski does not disclose all of the limitations of claim 1 alone. Claim 61 is therefore an improper dependent claim. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Claims 38, 44-48 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. In order to constitute statutory subject matter under 35 U.S.C. 101, a method must produce a useful, tangible, and concrete result. Although a determined physical quantity is certainly useful to one of ordinary skill in the art, it is not inherently tangible and concrete as data alone. In order to use the results of a calculation or processing method, it is necessary to take a step or steps in order to create a tangible and concrete change useable by one of ordinary skill in the art. This includes but is not limited to storing, printing, displaying, presenting to a user, generating an alert, alarm, or signal, or otherwise operating, controlling, or altering the functionality of further machinery, apparatuses, or processes in accordance with the calculated or prepared data. As examples, claim 1 includes the step of storing and claim 24 includes the step of providing.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 4-6, 15-16, 19, 22, 24, 26, 30, 32, 36, 38, 40, 44-47, 49-53, 55, 60-62, 65, 72-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kowalski (US pat 5459677) in view of Shenk (US pat 4866644) and Henriksen (US pat 4168431).

With respect to claim 1, Kowalski discloses a method comprising:

1) Obtaining, for a plurality of stable objects, a set of responses comprising one or more pairs of related responses representing measurements in the at least two spectral ranges performed with the slave instrument ant a set of responses, comprising one or more pair pairs of related responses representing measurements in the at least two spectral ranges performed with a master instrument (Figs 5a-b).

2) Wherein a pair of related responses of the master instrument corresponds to each pair of related responses of the slave instrument (Figs 5a-b).

3) Wherein each element in the corresponding pair of responses of the master instrument corresponds to an element in each pair of responses of the slave instrument (Figs 5a-b).

4) Determining, based on the sets of responses a correcting function, the correction function being a functional relationship the master instrument and the slave instrument (Fig 2a).

With respect to claim 4, Kowalski discloses determination of the correction function is being based on a regression method (column 1 lines 50-67).

With respect to claim 5, Kowalski discloses the regression method is selected from the group consisting of principal component regression, multiple linear regression, partial least squares regression, and artificial neural networks (column 1 lines 50-67).

With respect to claims 6, 26, 40, Kowalski discloses a correcting function.

With respect to claims 16 and 30, Kowalski discloses each response is an intensity (Figs 5-6).

With respect to claims 19 and 32, Kowalski discloses that each response is an absorbance being defined as the negative logarithm to a transmittance (column 17 lines 45-50).

With respect to claim 24, Kowalski discloses a method comprising:

1) Determining, based on measurements with the slave instrument, a pair of related responses (Fig 2a item 50).

2) Determining a correction function, the correction function being a functional relationship between a master instrument and a slave instrument (Fig 2a).

3) Providing a corrected high response (Fig 4b).

4) Calculating the corrected response and thereby providing a set of corrected responses (Fig 4b).

With respect to claim 38, Kowalski teaches determining corrected responses (Fig 2a) and determining a physical quantity by applying a calibrated functional relationship between the corrected values and a physical quantity on said corrected responses (Fig 4b).

With respect to claim 44, Kowalski discloses the calibration model is obtained by exposing the master instrument to a plurality of well-defined objects (Fig 2a items 40 and 52).

With respect to claim 45, Kowalski discloses the well-defined objects are defined such that physical properties of the objects have been established by a chemical process (column 7 lines 29-34).

With respect to claim 46, Kowalski discloses the chemical process is an officially recognized reference method for the determination of the physical properties (column 7 lines 29-34).

With respect to claims 47 and 55, Kowalski discloses each of the responses is one of: an intensity, a transmittance derived as a ratio between intensity resulting from measuring an object and a reference intensity, an absorbance defined as the negative logarithm to a transmittance, and a reflectance expressing the reflectance from the surface of an object, the reflectance being linearized using the Kubelka-Munk transform (Figs 5-6).

With respect to claim 49, Kowalski discloses:

3) Determining, for each area of the object, the objects response (Figs 2b and 4b).

4) Corrected the responses (Figs 2b and 4b).

5) Determining the physical quantity by applying a calibrated functional relationship between the corrected responses and a physical quantity on said corrected responses (Fig 4b).

With respect to claim 52, Kowalski discloses an apparatus comprising:

1) A computer (column 12 lines 24-27), and responses of the master instrument ant/or the responses of the slave instrument (Fig 2a).

2) A computer (column 12 lines 24-27) and a correction function, the correcting function being a functional relationship between the master instrument and the slave instrument (Fig 2a).

3) A computer on which to determine the calibration values (column 12 lines 24-27).

With respect to claim 53, Kowalski discloses electromagnetic radiation comprising rays (column 5 lines 39-50).

With respect to claim 61, Kowalski discloses a set comprising one or more stable objects, each object comprising at least two different chemical compositions which are substantially stable and each stable object having a response property (Fig 2a item 40 and 52 and column 7 lines 30-37).

With respect to claim 62, Kowalski discloses the response property is absorbance (column 17 lines 45-50).

With respect to claims 72-76, Kowalski discloses the number of stable object in the set of stable objects is at least 26 (Fig 7).

With respect to claim 1, Kowalski fails to disclose:

4) Determining, based on the sets of responses a correcting function, the correction function being a functional relationship between a ratio of related responses of the master instrument and a sum of a plurality of terms, each term being a product of a correcting coefficient and powers of related responses of the slave instrument, wherein each response raised to a power being a positive or negative real number, or zero, thereby determining a first set of correcting coefficients being multiplied bv respective of each of the terms.

5) Storing the first set of correcting coefficients in a memory means included in or adapted for communication with a data processing unit included in or adapted for communication with the slave instrument.

With respect to claim 2, Kowalski fails to disclose X-ray radiation.

With respect to claims 6, 26, 40, Kowalski fails to disclose the correcting function comprises a plurality of terms of the set form.

With respect to claim 15, Kowalski fails to disclose measurements on objects being conveyed.

With respect to claims 22 and 36, Kowalski fails to disclose monitoring reflectance.

With respect to claim 24, Kowalski fails to disclose:

2) Determining a ratio using a correction function, the correction function being a functional relationship between a ratio of related responses of a master instrument and a sum of a plurality of terms, each term of the plurality of terms being a product of a correcting coefficient and powers of related responses of the slave instrument wherein each response is raised to a power being a positive or negative real number, or zero.

3) Providing a corrected high response where it is substantially equal to the slave high response, or the corrected high response is determined using a further correcting function correlating the high correction and slave responses.

4) Calculating the corrected low response as equal to the corrected high response times the ratio of the low and high corrected responses.

With respect to claim 49, Kowalski fails to disclose:

1) Scanning substantially all or all of the object using X-ray beams having at least two energy levels, the at least two energy levels including a low energy level and a high energy level, the high energy level being higher relatively to the low energy level.

2) Detecting the X-ray beams having passed through the object for a plurality of areas of the object.

With respect to claims 50-51, Kowalski fails to disclose the physical quantity is fat content in food.

With respect to claim 52, Kowalski fails to disclose:

1) An accessing unit configured to access a memory, wherein the responses of the master instrument ant/or the responses of the slave instrument are stored ().

2) A processor configured to determine, based on the sets of responses, a correction function, the correcting function being a functional relationship between a ratio of related responses of the master instrument and a sum of a plurality of terms. each term being a product of a correction coefficient and powers of related responses of the slave instrument wherein each response is raised to a power being a positive or negative real number, or zero, there-by determining a first set of correcting coefficients being multiplied bv each of the terms.

3) A storage unit configured to store the first set of correction coefficients.

With respect to claim 60, Kowalski fails to disclose a storage unit.

With respect to claim 65, Kowalski fails to disclose the stable objects have varying thickness and/or areal density.

Henriksen teaches, with respect to claim 1:

4) Determining, based on the sets of responses a correcting function, the correction function being a functional relationship between a ratio of related responses of the master instrument and a sum of a plurality of terms, each term being a product of a correcting coefficient and powers of related responses of the slave instrument, wherein each response raised to a power being a positive or negative real number, or zero, thereby determining a first set of correcting coefficients being multiplied bv respective of each of the terms (Fig 3).

It would have been obvious to one of ordinary skill in the art to modify the method of Kowalski to determine a statistically-based equation through storing correction coefficients as taught by Henriksen. A response equation requires less storage space on a disk than a table of correction values and allows interpolation between measured points such that any input value can be corrected.

Henriksen teaches, with respect to claim 2, X-rays (Fig 1 item 13).

It would have been obvious to one of ordinary skill in the art to apply the method of Kowalski to a multiple energy level X-ray system as taught by Henriksen. Kowalski discloses that the method will work on any process and, as an example, cites the absorption of energy (column 5). X-ray systems are known and utilized in the art for inspection because they can penetrate through objects better than visible light.

Henriksen teaches, with respect to claims 6, 26, 40, the correcting function comprises a plurality of terms of the set form (Fig 3 and column 2 lines 29-55). Since the powers of the terms can include 0 as m_1 and 1 as n_1, it is within the range of interpretation that the term in question be simply Q_{low}.

It would have been obvious to one of ordinary skill in the art to modify the method of Kowalski to determine a statistically-based equation through storing correction coefficients as taught by Henriksen. A response equation requires less storage space on a disk than a table of correction values and allows interpolation between measured points such that any input value can be corrected.

Henriksen teaches, with respect to claim 15, Kowalski fails to disclose measurements on objects being conveyed (column2 lines 45-49).

It would have been obvious to one of ordinary skill in the art to apply the method of Kowalski to determining responses from conveyed goods as taught by Henriksen. Kowalski discloses that the method will work on any process and, as an example, cites the absorption of energy (column 5). Government standards for food inspection require consistence between inspection sites. The method of Kowalski, which ensures devices are calibrated together, would be well-suited to this issue.

Henriksen teaches, with respect to claim 24:

2) Determining a ratio using a correction function, the correction function being a functional relationship between a ratio of related responses of a master instrument and a sum of a plurality of terms, each term of the plurality of terms being a product of a correcting coefficient and powers of related responses of the slave instrument wherein each response is raised to a power being a positive or negative real number, or zero (Fig 3).

It would have been obvious to one of ordinary skill in the art to modify the method of Kowalski to determine a statistically-based equation through storing correction coefficients as taught by Henriksen. A response equation requires less storage space on a disk than a table of correction values and allows interpolation between measured points such that any input value can be corrected.

Henriksen teaches, with respect to claim 49:

1) Scanning substantially all or all of the object using X-ray beams having at least two energy levels, the at least two energy levels including a low energy level and a high energy level, the high energy level being higher relatively to the low energy level.

2) Detecting the X-ray beams having passed through the object for a plurality of areas of the object.

It would have been obvious to one of ordinary skill in the art to apply the method of Kowalski to a multiple energy level X-ray system as taught by Henriksen. Kowalski discloses that the method will work on any process and, as an example, cites the absorption of energy (column 5). X-ray systems are known and utilized in the art for inspection because they can penetrate through objects better than visible light.

Henriksen teaches, with respect to claims 50-51, the physical quantity is fat content in food (column 1).

It would have been obvious to one of ordinary skill in the art to apply the method of Kowalski to determining fat-content as taught by Henriksen. Kowalski discloses that the method will work on any process and, as an example, cites the absorption of energy (column 5). Government standards for food inspection require consistence between inspection sites. The method of Kowalski, which ensures devices are calibrated together, would be well-suited to this issue.

Henriksen teaches, with respect to claim 52:

1) An accessing unit configured to access a memory, wherein the responses of the master instrument ant/or the responses of the slave instrument are stored (Fig 1 item 27).

2) A processor (Fig 1 item 27) configured to determine, based on the sets of responses, a correction function, the correcting function being a functional relationship between a ratio of related responses of the master instrument and a sum of a plurality of terms, each term being a product of a correction coefficient and powers of related responses of the slave instrument

wherein each response is raised to a power being a positive or negative real number, or zero, there-by determining a first set of correcting coefficients being multiplied bv each of the terms (Fig 2).

3) A storage unit configured to store the first set of correction coefficients (Fig 1 item 27).

It would have been obvious to one of ordinary skill in the art to modify the method of Kowalski to determine a statistically-based equation through storing correction coefficients as taught by Henriksen. A response equation requires less storage space on a disk than a table of correction values and allows interpolation between measured points such that any input value can be corrected. Further it would have been obvious to one of ordinary skill in the art that the method of Kowalski be performed in a computer system with a processor and memory components in order to process and store data.

Henriksen teaches, with respect to claim 65, the stable objects have varying thickness and/or areal density (column 2 lines 3-28).

It would have been obvious to one of ordinary skill in the art to apply the method of Kowalski to determining fat-content in varied density and size samples of food as taught by Henriksen. Kowalski discloses that the method will work on any process and, as an example, cites the absorption of energy (column 5). Government standards for food inspection require consistence between inspection sites. The method of Kowalski, which ensures devices are calibrated together, would be well-suited to this issue.

Shenk teaches, with respect to claim 1:

5) Storing the first set of correcting coefficients in a memory means included in or adapted for communication with a data processing unit included in or adapted for communication with the slave instrument (Fig 2 item 42).

It would have been obvious to one of ordinary skill in the art to modify the system of Kowalski by storing calibration results as taught by Shenk. As it stands Kowalski discloses transferring calibration results from tool to tool which would be made substantially simpler by storing the results before the transfer.

Shenk teaches, with respect to claim 2:

3) Providing a corrected high response where it is substantially equal to the slave high response, or the corrected high response is determined using a further correcting function correlating the high correction and slave responses (Fig 2).

4) Calculating the corrected low response as equal to the corrected high response times the ratio of the low and high corrected responses (Fig 2).

It would have been obvious to one of ordinary skill in the art of modify the method of Kowalski by treating the systems as master (reference) and slave (target) systems and correcting the response of the slave to closer represent that of the master as taught by Shenk. This requires that only one system be 'perfect' in its response or, alternatively, that the errors of only one system be incorporated into measurements (the master). This creates standardization between all subservient systems to the controlled master.

Shenk teaches, with respect to claim 52:

3) Storing the first set of correcting coefficients in a memory means (Fig 2 item 42).

It would have been obvious to one of ordinary skill in the art to modify the system of Kowalski by storing calibration results as taught by Shenk. As it stands Kowalski discloses transferring calibration results from tool to tool which would be made substantially simpler by storing the results before the transfer.

Shenk teaches, with respect to claims 22 and 36, each of the responses is a reflectance expressing the reflectance from the surface of a respective of the objects (column 3 lines 37-46).

It would have been obvious to one of ordinary skill in the art to modify the system of Kowalski to work off of reflectance instead of absorption as taught by Shenk. Fundamentally the two concepts are the same, using the same sorts of emitters and sensors. The difference is mainly the location of the sensors relative to the object. Measuring reflectance would allow for lower power radiation to be used since it would not need to penetrate the sample.

Shenk teaches, with respect to claim 60, a storage unit (Fig 2 item 42).

It would have been obvious to one of ordinary skill in the art to modify the system of Kowalski by storing calibration results as taught by Shenk. As it stands Kowalski discloses transferring calibration results from tool to tool which would be made substantially simpler by storing the results before the transfer.

3.

Claims 18, 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Kowalski (US pat 5459677), Shenk (US pat 4866644), and Henriksen (US pat 4168431) as applied to claims 1, 24 above, and further in view of Lodder (US pat 4893253).

With respect to claims 18, 32, Kowalski discloses monitoring intensity.

With respect to claims 18, 32, Kowalski, Shenk, and Henriksen fail to discloses monitoring transmittance being a ratio between an intensity resulting from measuring an object and a reference intensity.

Lodder teaches, with respect to claims 18, 32, monitoring transmittance being a ratio between an intensity resulting from measuring an object and a reference intensity (column 5 lines 45-64).

It would have been obvious to one of ordinary skill in the art to modify the method of Kowalski, Shenk, and Henriksen to monitor transmittance as taught by Lodder. Kowalski discloses that the method will work on any process that can collect suitable data and mentions intensity as an example. Transmittance is a value calculated as a result of measured intensity and is therefore obvious as a chosen response to monitor.

Response to Arguments

Applicant argued, in the response filed 6/26/2006, against the rejection of claims 1-23 under 35 U.S.C. 101. The examiner agrees that this was improper as claim 1 recites the step of storing and now includes applying said correction values to a slave device. This rejection is withdrawn.

Applicant further argued against the combination of references Kowalski, Shenk, and Henriksen, stating that reference Henrickson fails to cure the deficiencies of Kowalski as Henriksen discloses only a single device. Kowalski, however, does disclose a master and a slave device and a relationship there between. Henriksen is not relied upon to teach this relationship, and is instead relied upon to teach forms of calculating fat content based upon X-ray data. The combination then, is the modification of the existing correcting function of Kowalski. Their

relationship is based upon the characteristics of the devices, the signals, and the target as are those of Henriksen. By defining the correcting function of Kowalski using the format of Henriksen (products of coefficients and related responses raised to powers) do we arrive at a combination that renders the claim obvious over the prior art.

Conclusion

Claims 3,7-14,17,20-21,23,25,27-29,31,33-35,37,39,41-43,54,56-59,63-64,66-71 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Moffat whose telephone number is (571) 272-2255. The examiner can normally be reached on Mon-Fri, from 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

8/3/06

JM

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